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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/500,334 | 12/30/2004 | Mitsuru Maeda | 47233-0042 | 8952 |

55694 7590 10/06/2008

DRINKER BIDDLE & REATH (DC)
1500 K STREET, N.W.
SUITE 1100
WASHINGTON, DC 20005-1209

| EXAMINER | |
|---|---|
| MCINTOSH III, TRAVISS C | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1623 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 10/06/2008 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/500,334 | MAEDA ET AL. | |
| | Examiner | Art Unit | |
| | TRAVISS C. MCINTOSH III | 1623 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *12 May 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1,8,9,11-15,21 and 26-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,8,9,11,12,14,15,21,26,27 and 30* is/are rejected.

7)☒ Claim(s) *13,28 and 29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/19/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

**DETAILED ACTION**

The Amendment filed 5/12/2008 has been received, entered into the record, and carefully considered. The following information provided in the amendment affects the instant application by:

Claims 1, 12, and 15 have been amended.

No claims have been added.

Claims 2-7, 10, 16-20, and 22-25 have been canceled.

Remarks drawn to rejections of Office Action mailed 2/13/2008 include:

101 rejections: which have been overcome by applicant's amendments and have been withdrawn.

Claim objections: which have been overcome by applicant's amendments and have been withdrawn.

102(b) rejection: which has been overcome as while the '954 document discloses the claimed compound, it is noted that they did not exemplify the purification and isolation of the compounds.

103(a) rejection: which has been maintained for reasons of record.

An action on the merits of claims 1, 8, 9, 11-15, 21, and 26-30. is contained herein below.

***Information Disclosure Statement***

Applicants stated that the examiner has not acknowledged the IDS filed 4/19/2006, however, it is noted a copy of this IDS was mailed to applicants with the 7/31/2006 Office action. A copy of the IDS which was initialed and mailed on 7/31/06 is attached hereto for applicant's convenience. Applicants can also review PAIR to see these completed documents and ensure the record is complete.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The rejection of claims 1, 8, 9, 11-12, 14-15, 21, 26-27, and 30 under 35 U.S.C. 103(a) as being unpatentable over JP 53098954 and further in view of Sakai et al. (US 5,407,812 of record) is maintained for reasons of record.

Claim 1 is drawn to a 2-O-β-D-glucopyranosyl-L-ascorbic acid compound. Claims 8 and 9 provide the saccharide comprises acetyl groups in the 2', 3', 4', and 6'-positions of the sugar. Claims 11 and 12 are drawn to methods of making the product using a glucosyltransferase. Claims 14-15, 21, 26-27, and 30 are drawn to various forms of compositions comprising the active agent.

The '954 patent discloses 2-O-(β-D-glucopyranosyl)-L-ascorbic acid (see page 6, 2nd paragraph). The '954 patent also teaches to protect the sugar hydroxyl groups with acetyl groups (see page 9, 2nd full paragraph). Page 10 of the document they discuss protecting the 3-position hydroxyl to obtain a compound which is only has the sugar bonded to the 2-position of the ascorbic acid, thus producing the instantly claimed compound. The '954 patent also teaches their compound has vitamin C activity (see last paragraph on page 11). What is not taught is to make with a saccharide transferring enzyme (glucosyltransferase) nor compositions comprising the same.

Sakai et al. teach to make their glucopyranosyl ascorbic acid compounds using a saccharide-transferring enzyme (see paragraph bridging columns 3 and 4). Sakai et al. teach that an amount of 0.001% or more of their alpha derivative is acceptable for use (see column 8, lines 33-48). Sakai et al. also teach that their composition may be used in various forms, such as cosmetic, pharmaceutical, or dietary uses (see column 9, lines 49-61).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the saccharide transferring enzymes of Sakai et al. to make the compounds of the '954 patent. Sakai et al. teach methods of making their compounds using L-ascorbic acid and their α-glucosyl saccharide and a saccharide-transferring enzyme. As such, it would be obvious to make the β-derivatives as instantly claimed with the methods of making the α-glucosyl derivatives in the art merely by using a β-derivative as a starting compound instead of the art taught α-glucosyl compound, as well as using a β-transferase. Moreover, the fact that applicants obtained compositions comprising both 2-O and 6-O derivatives is seen to be inherent within the methods taught. That is, since the methods claimed are seen to be obvious, and the 6-O derivative is produced by the obvious method, the method of making the mixture, as well as the mixture, is also seen to be obvious. moreover, the '954 patent teaches the beta-derivative derivative instantly claimed, as well as teach the compound has vitamin C activity, as set forth supra. It is well established that a composition (composition plus carrier) is allowable only if no utility is disclosed for the old compound and the '954 patent teach that their compounds are vitamin C derivatives. See ***Ex parte Douros, 163 USPQ 667 (PTO Bd. App. 1968).***

It is noted that applicants argue that the '954 patent fails to provide an enabling disclosure for teaching the compound of claim 1. Applicants provide a declaration which attempts to demonstrate that JP 53-098954 lacks an enabling disclosure on how to make the claimed ascorbic acid compounds. However, it is noted that the declaration states that the experiment provided is analogous to the method described in the '954 patent on page 408 in Japanese. It is noted the examiner in unable to locate page 408 of the document, and the methods

set forth in the declaration are not seen to be commensurate in scope with those disclosed in the '954 patent. Applicants even note in paragraph 14 of the declaration that "while this is not the experiment described in JP 53-098954". As such, correlative examples have not been provided. If applicants are submitting a declaration to show the methods disclosed in the '954 document do not produce the claimed compounds, this is not convincing as the methods set forth therein are not being practiced to make the instant compounds. The specification of the '954 document sets forth guidance for protecting the 3'-position, and also for deprotection of the remaining groups, which is not seen to be practiced in the declaration.

Moreover, the examiner does not argue that the '954 patent exemplifies a specific method of making the claimed compound. The examiner also notes that not every compound set forth in the specification must be exemplified and working examples are not required. The specification (disclosure) should contain at least a generic teaching of how to prepare the compounds whose preparation is not specifically disclosed. See Ex parte Druey, 145 USPQ 219 (POBA 1964). The '954 document is seen to teach a generic method of making the instant compounds, and those which are set forth therein. The '954 patent teaches 2-O-(β-D-glucopyranosyl)-L-ascorbic acid (see page 6, 2nd paragraph) and to protect the sugar hydroxyl groups with acetyl groups (see page 9, 2nd full paragraph) as set forth supra. Applicants argue that cleavage of the ether linkage at position 3 without destroying the acetal linkage at position 2 would be difficult. The examiner notes that because something is difficult does not mean it is not enabled.

Applicants then state that the process described by the '954 patent cannot produce an unprotected compound that is also 2-substituted because the document does not teach a process by which all the protecting groups can be removed without destroying the glycoside bond on the

ascorbic acid. However, applicants then note that the '954 patent does indeed state that "it is necessary to eliminate the protecting groups under basic, neutral, or weakly acidic conditions as to not cleave the glycoside bond of ascorbic acid". Thus, the examiner believes the '954 patent does indeed understand that the protecting groups must be removed without destroying the glycosidic bond.

Applicants then argue that since the declaration shows the 2-O-glucopyranosyl ascorbic acid compound could not have been produced, the intermediates therein could not have been produced. The examiner disagrees. The '954 patent discloses the compound 2-O-(β-D-glucopyranosyl)-L-ascorbic acid and discloses protecting the sugar hydroxy groups with acetyl groups, which would produce the species of claim 9.

Applicants then argue that Sakai fails to remedy these deficiencies and actually teaches away from making or using the claimed β-forms. It is noted that the examiner is relying on Sakai for its teaching of the use of a saccharide-transferring enzyme for making the compounds. Applicants also note that enzymes that act on α-forms of a compound cannot always act on the β-forms. However, this is seen to be convincing as an obvious to try method. It would be at least obvious to try to use the enzymes as set forth in Sakai to make the compounds as because enzymes that act on α-forms of a compound cannot always act on the β-forms, it is also true that enzymes that act on α-forms of a compound can sometimes act on the β-forms.

Regarding applicants arguments drawn to Muto, just because the reference does not teach the exact claimed compounds and methods, does not mean the reference then teaches away from the claimed subject matter. Likewise, applicants arguing that combining Muto and Sakai would teach away from the present claims is not convincing, as the rejection is not over Muto. The

examiner believes that the generic claim to using a β-transferase is rendered obvious by the arts teaching of using the same α-transferase in making the α-compounds for reasons of "obvious to try" at the minimum.

Applicants then argue that it would have been apparent to a skilled artisan that it is impossible to synthesize ascorbic acid derivatives with an unprotected 3-hydroxy group based upon the method described in the '954 patent. The examiner notes that in looking at the '954 patent as a whole, and not just what is exemplified, it would be obvious to make the compounds instantly claimed. The specification teaches if the 2-substituted compound is desired, one should protect the 3-position, and also subsequently deprotect the compound cautiously as to not degrade the glycoside bond.

Applicants note and the examiner agrees that claim 27 is not a composition claim.

Applicants argue that inherency is immaterial is the record establishes that one would not appreciate the inherent feature. However, the '954 patent discloses the claimed compound and it's presently claimed supposedly novel feature, that it is a vitamin C providing compound. And regarding inherency, the examiner was merely stating that the method of producing the 2-substituted compound would be expected to also produce the 6-substituted compound.

Regarding applicant's position on Erdmann, the examiner agrees with applicants statements.

Regarding applicants statements on Douros, applicants have not provided sufficient evidence that the presently claimed compounds are patentable, and thus Douros still applies.

Regarding applicants statements on page 13 that KSR requires a skilled artisan to find it "obvious to successfully obtain" the compounds. The examiner notes this is not the standard set

forth by KSR, rather KSR sets forth it must be "obvious to try", which has been met by the above combination of references.

Applicants then argue that to develop enzymatic synthesis method, as recited in claims 11-12, it was required to find a specific beta-transferase as set forth in example 5. The examiner notes these specific enzymes are not set forth in claims 11 and 12, but rather in claims 13, 28, and 29, none of which were rejected. Applicants are arguing limitations which are not in the rejected claims.

The thrust of applicants arguments are that the '954 patent is not enabled. However, because something is "difficult" as argued on page 8, line 6, does not mean they are not possible. Applicants also argue that the hydroxyl group at the 3-position is more acidic and reactive than the hydroxyl group of the 2-position, and note this would be known to a chemist (see declaration). As such, this provides further evidence that that which was disclosed in the '954 patent would render obvious the instant compounds as nothing unexpected would occur if this is all known to a chemist, i.e. a one of ordinary skill in the art.

***Conclusion***

Claims 13, 28, and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TRAVISS C. MCINTOSH III whose telephone number is (571)272-0657. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shaojia A. Jiang can be reached on 571-272-0627. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Traviss C McIntosh III/
Art Unit 1623
September 30, 2008